What is claimed is:

1. A photonic lead system, comprising:

a photonic lead having a distal end and a proximal end; and

a magnetic radiation coil, located in said distal end, to detect characteristics of magnetic radiation of a predetermined nature.

2. The photonic lead system as claimed in claim 1, further comprising:

a second magnetic radiation coil, located in said distal end, to detect characteristics of magnetic radiation of a second predetermined nature.

3. The photonic lead system as claimed in claim 1, further comprising:

a second magnetic radiation coil, located in said distal end, to detect characteristics of magnetic radiation of a second predetermined nature; and

a third magnetic radiation coil, located in said distal end, to detect characteristics of magnetic radiation of a third predetermined nature.

4. The photonic lead system as claimed in claim 1, wherein said magnetic radiation coil is rotatable within said photonic lead.

5. The photonic lead system as claimed in claim 2, wherein said second magnetic radiation coil being positioned within said photonic lead to form a predetermined angle said magnetic radiation coil.

6. The photonic lead system as claimed in claim 2, wherein said second magnetic radiation coil being positioned within said photonic lead to be substantially perpendicular to said magnetic radiation coil.

7. The photonic lead system as claimed in claim 1, further comprising:

an amplifier connected to said magnetic coil; and

a control circuit connected to said amplifier to produce control signals corresponding to the detected characteristics of the magnetic radiation.

8. The photonic lead system as claimed in claim 7, further comprising:

a light source, in the proximal end of said photonic lead, to produce a first light having a first wavelength and a second light having a second wavelength;

a wave-guide between the proximal end and distal end of said photonic lead; and

a distal sensor, in the distal end of said photonic lead, to convert the first light into electrical energy and, responsive to said control signals, to reflect the second light back the proximal end of said photonic lead such that a characteristic of the second light is modulated to encode the detected characteristics of the magnetic radiation.

9. The photonic lead system as claimed in claim 8, further comprising:

a proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy.

10. The photonic lead system as claimed in claim 9, further comprising:

a transmitter, in the proximal end of said photonic lead and operatively connected to said proximal sensor, to transmit, in response the electrical energy from the converted modulated second light, information representing the detected characteristics of the magnetic radiation.

11. The photonic lead system as claimed in claim 8, wherein said light source includes a first emitter to emit the first light having the first wavelength and a second emitter to emit the second light having the second wavelength.

12. The photonic lead system as claimed in claim 8, wherein said light source includes a first laser to produce the first light having the first wavelength and a second laser to produce the second light having the second wavelength.

13. The photonic lead system as claimed in claim 8, wherein said distal sensor includes:

an optical attenuator coupled to a mirror; and

an optical-electrical conversion device to convert the first light into electrical energy;

said optical attenuator attenuating the second light to encode the detected characteristics of the magnetic radiation.

14. The photonic lead system as claimed in claim 13, wherein said optical attenuator attenuating the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

15. The photonic lead system as claimed in claim 13, wherein said optical attenuator attenuating the second light to create light having differing intensities over a period of time.

16. The photonic lead system as claimed in claim 13, further comprising:

a beam splitter to direct the second light to said optical feedback device and to direct said first light to said optical-electrical conversion device.

17. The photonic lead system as claimed in claim 13, wherein said optical attenuator comprises liquid crystal material having a variable optical transmission density responsive to applied electrical voltage.

18. The photonic lead system as claimed in claim 8, wherein said distal sensor includes:

a variable reflectance optical reflector; and

an optical-electrical conversion device to convert the first light into electrical energy;

said variable reflectance optical reflector variably reflecting the second light to encode the detected characteristics of the magnetic radiation.

19. The photonic lead system as claimed in claim 18, wherein said variable reflectance optical reflector variably reflecting the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

20. The photonic lead system as claimed in claim 18, wherein said variable reflectance optical reflector variably reflecting the second light to create light having differing intensities over a period of time.

21. The photonic lead system as claimed in claim 17, further comprising:

a beam splitter to direct the second light to said variable reflectance optical reflector and to direct said first light to said optical-electrical conversion device.

22. The photonic lead system as claimed in claim 8, wherein said distal sensor includes an optical-electrical conversion device to convert the first light into electrical energy and a variable reflectance optical reflector overlaying said optical-electrical conversion device;

said variable reflectance optical reflector variably reflecting the second light to encode the detected characteristics of the magnetic radiation and being optically transparent to said first light.

23. The photonic lead system as claimed in claim 22, wherein said variable reflectance optical reflector variably reflecting the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

24. The photonic lead system as claimed in claim 22, wherein said variable reflectance optical reflector variably reflecting the second light to create light having differing intensities over a period of time.

25. The photonic lead system as claimed in claim 8, wherein said wave-guide is a fiber optic.

26. The photonic lead system as claimed in claim 8, wherein said wave-guide includes a first fiber optic to transmit the first light and a second fiber optic to transmit the second light.

27. The photonic lead system as claimed in claim 8, wherein said wave-guide is a bundle of fiber optics.

28. The photonic lead system as claimed in claim 7, further comprising:

a light source, in the proximal end of said photonic lead, to produce a first light having a first wavelength;

a wave-guide between the proximal end and distal end of said photonic lead; and

a distal sensor, in the distal end of said photonic lead, to convert the first light into electrical energy and, responsive to said control signals, to emit a second light having a second wavelength to proximal end of said photonic lead such that a characteristic of the second light is modulated to encode the detected characteristics of the magnetic radiation.

29. The photonic lead system as claimed in claim 28, further comprising:

a proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy.

30. The photonic lead system as claimed in claim 28, further comprising:

a transmitter, in the proximal end of said photonic lead and operatively connected to said proximal sensor, to transmit, in response the electrical energy from the converted modulated second light, information representing the detected characteristics of the magnetic radiation.

31. The photonic lead system as claimed in claim 28, wherein said light source includes a laser to produce the first light having the first wavelength and said distal sensor includes a second laser to produce the second light having the second wavelength.

32. The photonic lead system as claimed in claim 28, wherein said distal sensor includes:

an emitter to produce the second light having the second wavelength; and

an optical-electrical conversion device to convert the first light into electrical energy;

said emitter modulating the second light to encode the detected characteristics of the magnetic radiation.

33. The photonic lead system as claimed in claim 32, wherein said emitter modulating the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

34. The photonic lead system as claimed in claim 32, wherein said emitter modulating the second light to create light having differing intensities over a period of time.

35. The photonic lead system as claimed in claim 28, wherein said distal sensor includes:

an on-axis emitter to produce the second light having the second wavelength; and

an on-axis optical-electrical conversion device to convert the first light into electrical energy;

said on-axis emitter modulating the second light to encode the detected characteristics of the magnetic radiation.

36. The photonic lead system as claimed in claim 25, wherein said on-axis emitter modulating the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

37. The photonic lead system as claimed in claim 35, wherein said on-axis emitter modulating the second light to create light having differing intensities over a period of time.

38. The photonic lead system as claimed in claim 28, wherein said distal sensor includes:

an off-axis emitter to produce the second light having the second wavelength; and

an on-axis optical-electrical conversion device to convert the first light into electrical energy;

said off-axis emitter modulating the second light to encode the detected characteristics of the magnetic radiation.

39. The photonic lead system as claimed in claim 38, wherein said off-axis emitter modulating the second light to create pulses of light having equal intensity and periods of no light, the periods of no light differing in time in response to the detected characteristics of the magnetic radiation.

40. The photonic lead system as claimed in claim 38, wherein said off-axis emitter modulating the second light to create light having differing intensities over a period of time.

41. The photonic lead system as claimed in claim 38, further comprising:

a beam splitter to direct the second light to said wave-guide and to direct said first light to said on-axis optical-electrical conversion device.

42. The photonic lead system as claimed in claim 28, further comprising:

an on-axis proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy.

43. The photonic lead system as claimed in claim 28, further comprising:

an on-axis proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy;

said light source being on-axis.

44. The photonic lead system as claimed in claim 28, further comprising:

an off-axis proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy.

45. The photonic lead system as claimed in claim 28, further comprising:

an on-axis proximal sensor, in the proximal end of said photonic lead, to convert the modulated second light into electrical energy;

said on-axis proximal sensor being optically transparent to the first light.

46. The photonic lead system as claimed in claim 28, wherein said wave-guide is a fiber optic.

47. The photonic lead system as claimed in claim 28, wherein said wave-guide includes a first fiber optic to transmit the first light and a second fiber optic to transmit the second light.

48. The photonic lead system as claimed in claim 28, wherein said wave-guide is a bundle of fiber optics.